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Report on Ambient Air Monitoring For Methyl Bromide and 1,3-Dichloropropene In Ventura County during August and September 2005

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Monitoring Report Approval

Report Title: Report on Ambient Air Monitoring For Methyl Bromide and 1,3-Dichloropropene in Ventura County During August and September 2005

Project Lead: Jack Romans, Air Pollution Specialist

Approval: The following monitoring report has been reviewed and approved by the Monitoring and Laboratory Division.

Signatures:

Mac McDougall, Manager Special Purpose Monitoring Section	Date
Kenneth R. Stroud, Chief Air Quality Surveillance Branch	Date
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Executive Summary

Report on Ambient Air Monitoring For Methyl Bromide and1,3-Dichloropropene In Ventura County During August and September 2005

At the request of the Department of Pesticide Regulation (DPR), the Air Resources Board ARB) conducted ambient air monitoring for methyl bromide and 1,3-dichloropropene (common trade name: Telone) in Ventura County from August 22 to September 30, 2005. These compounds are primarily used as soil fumigants prior to the planting of strawberries and the timing of the monitoring was designed to coincide with their period of peak-use.

One hundred and eighty-one (181), 24-hour integrated air samples were collected by staff of the Air Quality Surveillance branch from six locations throughout the county, Monday through Friday, using evacuated canisters equipped with sample flow controllers. The sampling locations were chosen for their proximity to both agricultural fields and populations. The collected air samples were analyzed by the Northern Laboratory Branch in Sacramento to determine methyl bromide, cis-1,3-dichloropropene, and trans-1,3-dichloropropene concentrations in nanograms per cubic meter (ng/m^3).

- Reported methyl bromide results from 159 validated samples indicated ambient concentrations ranging from less than the Minimum Detection Level of 7.7 ng/m^3 to a maximum of 15,800 ng/m^3 occurring on August 29-30 at the CA Department of Forestry site.

- Reported cis-1,3-dichloropropene results from 165 validated samples indicated ambient concentrations ranging from less than the MDL of 5.8 ng/m^3 to a maximum of 40,700 ng/m^3 occurring on September 12-13 at the CALTRANS site.

- Reported trans-1,3-dichloropropene results from 165 validated samples indicated ambient concentrations ranging from less than the MDL of 4.4 ng/m^3 to 36,100 ng/m^3 also occurring on September 12-13 at the CALTRANS site.

In comparison, during ambient air monitoring in Monterey and Santa Cruz Counties in 2001, maximum reported concentrations of methyl bromide, cis and trans-1,3-dichloropropene at MacQuiddy Elementary School were 142,000, 3,860, and 3,420 ng/m^3 respectively. Sampling and analytical methods were essentially the same for both 2001 and 2005.

Quality control field samples included 34 collocated pairs, 4 field spikes, 2 trip spikes and 4 trip blanks. The average Relative Percent Difference of the collocated pairs for methyl bromide, cis and trans-1,3-dichloropropene were 28.7%, 17.9%, and 24.1% respectively. Field spike recovery percentages for methyl bromide, cis and trans-1,3-dichloropropene averaged 93%, 75%, and 68% respectively. All trip blank results were less than the estimated quantification limit (EQL) of 58 ng/m^3, 44 ng/m^3, and 33 ng/m^3 for methyl bromide, cis and trans-1,3-dichloropropene respectively. These EQLs are based upon a canister dilution ratio of 1:1.5 cited in Appendix C of this report.

Monitoring was prematurely halted after 5 weeks rather than the planned 8 sequential weeks. New information indicated that the peak-use period of these compounds had shifted from August and September to June and July. As a result, the DPR requested and the ARB agreed to repeat this monitoring in Ventura County during June and July 2006.

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ACKNOWLEDGEMENTS

The authors wish to acknowledge Peter Ouchida, Steve Aston, Steve Rider and Jerry Wehling of Monitoring and Laboratory Division's (MLD) Air Quality Surveillance branch for their assistance in this project. We also thank Russell Grace, Jim Omand and Karen Fletcher of MLD's Northern Laboratory Branch for supplying canisters and performing chemical analyses. Thanks also to Lynn Baker of the Stationary Source Division and Randy Segawa of the Department of Pesticide Regulation for their technical and regulatory advice.

1.0 Introduction

At the request of the California Department of Pesticide Regulation (DPR) (August 30, 2004 Memorandum; Gosselin to Lloyd), the Air Resources Board (ARB) conducted ambient air monitoring for the pesticides methyl bromide (MeBr) and 1,3-dichloropropene (Telone). Telone is the common Trade Name for a mixture of two isomers, cis-1,3-dichloropropene and trans-1,3-dichloropropene.

One hundred and eighty-one (181) canister samples were collected at six (6) different monitoring sites in Ventura County from August 22, 2005 to September 30, 2005. This monitoring was performed under the requirements of AB 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5) which requires the ARB, "…to document the level of airborne emissions…of pesticides that may be determined to pose a present or potential hazard...", when requested by the DPR.

The recommended timeframe for this monitoring, August and September, coincided with the historical peak-use period of these fumigants prior to the planting of strawberries. 2005 was the first year the DPR had requested ambient monitoring for methyl bromide and Telone in Ventura County. The ARB had previously conducted ambient air monitoring studies for Telone in Merced and Kern Counties in the 1990's, and methyl bromide and Telone in Monterey and Santa Cruz Counties in both 2000 and 2001. The monitoring in Kern County used charcoal-filled cartridges for Telone collection and the monitoring in Monterey and Santa Cruz Counties used evacuated canisters for both methyl bromide and Telone.

2.0 Sampling Sites

Locations of the sampling sites are indicated on the use-maps for methyl bromide and Telone presented in **Figures 1 and 2** respectively. ARB staff, in consultation with DPR, selected these sampling sites based upon several factors:

- Historical use of methyl bromide and Telone as indicated by the use-maps.
- Proximity of sampling site to agricultural fields.
- Presence or proximity of residents, students, or populations in general to fields.
- Considerations for both staff accessibility and security of the sampling equipment.
- Maximum practical compliance with established siting criteria.

The use-maps supplied to the ARB by the DPR represented the most current (Fall, 2003) use information known at the time. The ARB understands that the DPR will verify and quantify the usage of these fumigants during the study period when that information becomes available.

Six (6) locations in Ventura County were selected as monitoring sites. The site at Lincoln Elementary School near downtown Ventura was designated as the background site because of its upwind location and greater relative distance from agricultural areas. The remaining monitoring sites were either adjacent to or in proximity with agricultural areas. All six monitoring sites were located at an elevation of less than 150 feet above mean sea level. Photographic images of each of the following monitoring sites are presented in **Appendix A**:

Lincoln Elementary School, 1107 E. Santa Clara St., Ventura, CA, 93001, (805) 641-5438
GPS: N 34º 16.787', W 119º 17.034'

CA Dept. of Transportation (CALTRANS) Station, 4821 Adohr Lane, Camarillo, CA 93012
GPS: N 34º 12.407', W 119º 00.414'

Ventura County Fire Dept. Maintenance Facility, 2451 Latigo Road, Oxnard, CA 93030
GPS: N 34º 12.675', W 119º 08.595'

United Water Conservation District, 3561 Rose Avenue, Oxnard, CA 93030
GPS: N 34º 15.160', W 119º 08.193'

Laguna Vista Elementary School, 5084 Etting Road, Oxnard, CA 93033
GPS: N 34º 09.695', W 119º 05.645'

CA Dept. of Forestry / CA Youth Authority, 2800 Wright Road, Camarillo, CA 93010
GPS: N 34º 14.702', W 119º 06.457'

Figures on pages 3 and 4 can be found on web page.

3.0 Methods

24-hour integrated ambient air samples were collected Monday through Friday for a minimum of four samples per week per site, holidays not-included. The air samples were collected by an air sampler consisting of a sample probe, passive flow controller, and evacuated canister. The target sample flow rate of three standard cubic centimeters per minute was measured using a certified transfer standard mass flow meter (MFM) at the beginning and again at the end of each sample collection period. The certification certificate for the MFM used is presented in **Appendix E.**

At the end of each week, canister samples were transported to the MLD laboratory in Sacramento by ARB staff. In addition to ambient air samples, quality control samples consisting of collocated samples, field spikes, trip spikes, and trip blanks were also collected.

For details of the monitoring method, please refer to **Appendix B**, "Protocol for the Ambient Monitoring for Methyl Bromide and 1,3-Dichloropropene in Ventura County During Summer/Fall 2005 (August 23, 2005). A significant deviation from this protocol in the actual monitoring was a change in the length of the monitoring study from 8 to 5 weeks. This change was due to the passing of the peak-use window as well as technical problems experienced by the laboratory.

Collected samples were analyzed using the laboratory method, "Standard Operating Procedures for the Sampling and Analysis of Bromomethane and 1,3-dichloropropene in Silco™ Canisters", attached to S.O.P. No. MLD 058 – Determination of Aromatic and Halogenated Compounds in Ambient Air by Capillary Column Gas Chromatography/Mass Spectrometry (May 15, 2002). This method was used as the primary analysis method for methyl bromide, cis-1,3-dichloropropene and trans-1,3-dichloropropene, and may be seen in its entirety at **http://www.arb.ca.gov/aaqm/sop/sop_058.pdf**. Samples with concentrations above the calibration range were diluted prior to analysis. **Appendix C** contains the laboratory results report entitled, "Bromomethane and 1,3-Dichloropropene Method Development and Analytical Results for Ventura County Ambient Air Monitoring Samples Collected in Six-liter Silco™ Canisters (April 4, 2006, Revision 1).

Subsequent to the 2005 sampling and analysis, the laboratory updated its method validation data and presented the results in a memorandum dated October 6, 2006 from Russell Grace to Mac McDougall entitled, "Updated Method Validation Data". Only results of the updated storage stability study were applied to the "Monitoring Results" presented in **Table 1** of this report. This memorandum is presented in its entirety as **Appendix F**.

4.0 Results

All collected samples and their respective analytical results (if available) are presented in **Table 1**, "Monitoring Results". These analytical results were obtained from **Appendix C, "**Laboratory Results Report". For additional information on the analytical results, please refer to **Appendix C**.

A unique Sample Identification Name was assigned to each canister by field staff as the canisters were prepared for sampling. This example of a Sample Identification Name, **1-LS-C-9999,** can be deciphered by the following legend:

1- Numeral indicates the sequential sample run day. All samples from that day have this same number. Next day's samples would start with "2", etc.

LS- Letters are an abbreviation for the site name (e.g., **L**incoln **S**chool).

C- Abbreviation for **C**ollocated sample. Other abbreviations used to identify Quality Control sample type include: "**TB**" for **T**rip **B**lank; "**TS**" for **T**rip **S**pike; and "**FS**" for **F**ield **S**pike.

9999- Permanent canister identification number; assigned by laboratory.

Abbreviations used in the Sample Identification Names denote the following site names:

LS - **L**incoln Elementary **S**chool (designated background sampling site)
CT - **C**al**T**rans
LV - **L**aguna **V**ista Elementary School
FS - **F**ire **S**tation
DF - CA **D**epartment of **F**orestry
WD - **W**ater Reclamation **D**istrict

MDL – Method Detection Limit

EQL – Estimated Quantitation Limit

DET – Detected Analytical result (not quantifiable) $\geq$ MDL and < EQL

Note: **Shaded cell(s) in Table 1 indicate an invalid sample. Additional comments pertaining to each invalid sample can be found at the bottom of its respective table.**

Out of a total of 181 collected sample canisters, 168 methyl bromide, and 176 cis and trans-1,3-dichloropropene analytical results are considered valid for a data completeness ratio of 92.8% and 97.2% respectively.

4.0 **Results** (continued)

Table 1

Monitoring Results

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
1	1-LS-1185	8/22 0925	8/23 1010	INVALID	INVALID	INVALID
2	1-CT-1091	1105	1105	INVALID	8.67E+02	7.54E+02
3	1-LV-1187	1200	1155	INVALID	1.97E+02	1.77E+02
4	1-FS-1172	1245	1250	4.18E+02	4.57E+02	4.42E+02
5	1-DF-1105	1325	1325	8.83E+02	4.62E+02	4.93E+02
6	1-WD-1132	1355	1400	3.03E+02	6.05E+02	5.89E+02
7	2-LS-1097	8/23 1015	8/24 0950	1.37E+02	1.97E+02	1.91E+02
8	2-LS-C-1084	1025	0955	1.54E+02	1.99E+02	1.99E+02
9	2-CT-1137	1110	1035	INVALID	2.90E+03	2.37E+03
10	2-CT-C-1111	1115	1040	INVALID	2.59E+03	2.22E+03
11	2-LV-1176	1200	1125	2.71E+03	1.07E+03	1.16E+03
12	2-LV-C-1157	1210	1130	1.81E+03	6.62E+02	6.00E+02
13	2-FS-1133	1255	1205	7.59E+02	7.01E+02	7.36E+02
14	2-FS-C-1178	1300	1210	6.91E+02	7.03E+02	6.50E+02
15	2-DF-1179	1330	1235	7.65E+02	4.76E+02	4.92E+02
16	2-DF-C-1159	1340	1245	8.04E+02	4.85E+02	4.82E+02
17	2-WD-1071	1405	1305	6.94E+02	1.38E+03	1.32E+03
18	2-WD-C-1180	1415	1315	6.20E+02	1.25E+03	1.21E+03
19	3-LS-1124	8/24 1000	8/25 0910	2.38E+02	1.06E+02	7.68E+01
20	3-CT-1186	1040	1015	1.28E+03	4.01E+03	3.57E+03
21	3-LV-1126	1135	1050	2.49E+03	7.07E+02	6.51E+02
22	3-FS-1148	1215	1130	6.82E+02	7.25E+02	6.96E+02
23	3-DF-1098	1240	1200	2.44E+03	4.66E+02	4.25E+02
24	3-WD-1062	1310	1230	3.24E+02	1.89E+03	1.88E+03
25	4-LS-1175	8/25 0915	8/26 0835	DET	2.90E+02	2.38E+02
26	4-CT-1153	1020	0920	3.23E+03	3.77E+03	3.64E+03
27	4-LV-1056	1100	1000	4.29E+03	2.41E+03	2.14E+03
28	4-FS-1064	1130	1030	4.03E+03	1.18E+03	1.06E+03
29	4-DF-1122	1205	1055	7.41E+03	2.63E+03	2.24E+03
30	4-WD-1171	1230	1115	5.86E+03	2.72E+03	2.73E+03
31	4-TB-1152	8/26 1120	8/29 1000	<MDL	DET	DET

#1 - Invalid: Flow meter used for setup had low-battery causing erroneous readings.

#'s 2, 3, 9, and 10 – Invalid MeBr analytical results per lab

#29 – Sample collection period outside of 24 +/-1 hour (1,380 to 1,500 minutes): 1,370 min

#30 - Sample collection period outside of 24 +/-1 hour (1,380 to 1,500 minutes): 1,365 min

#31-Trip Blank

4.0 **Results** (continued)

Table 1

Monitoring Results (continued)

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
32	5-LS-1151	8/29 0835	8/30 0830	6.94E+02	DET	1.39E+02
33	5-LS-C-1068	0840	0840	4.83E+02	1.56E+02	1.36E+02
34	5-CT-1142	0925	0920	6.29E+02	2.49E+02	2.42E+02
35	5-CT-C-1177	0935	0925	9.01E+02	2.16E+02	2.05E+02
36	5-LV-1196	1020	0955	2.10E+03	3.71E+02	3.28E+02
37	5-LV-C-1067	1025	1005	1.33E+03	DET	DET
38	5-FS-1050	1050	1045	4.25E+03	4.98E+02	4.67E+02
39	5-FS-C-1066	1055	1050	3.60E+03	6.27E+02	6.39E+02
40	5-DF-1164	1120	1110	1.45E+04	5.67E+02	4.70E+02
41	5-DF-C-1129	1125	1115	1.58E+04	6.22E+02	5.49E+02
42	5-WD-1128	1150	1130	1.20E+04	1.38E+03	1.16E+03
43	5-WD-C-1090	1155	1135	1.53E+04	1.33E+03	1.36E+03
44	6-LS-1170	8/30 0835	8/31 0750	DET	<MDL	<MDL
45	6-LSC-1093	8/30 0840	8/31 0800	SEE	FIELD SPIKE	RESULTS
46	6-CT-1089	0925	0835	3.74E+02	1.65E+02	1.75e+02
47	6-LV-1138	1000	0900	6.77E+02	DET	DET
48	6-FS-1060	1050	0950	5.35E+02	3.47E+02	3.17E+02
49	6-DF-1135	1110	1010	1.34E+03	3.30E+02	3.22E+02
50	6-WD-1065	1135	1030	5.06E+02	2.33E+02	2.40E+02
51	7-LS-1163	8/31 0755	9/1 0735	DET	DET	DET
52	7-CT-1088	0840	0810	2.87E+02	1.40E+03	1.18E+03
53	7-LV-1134	0910	0840	2.61E+02	9.12E+02	7.99E+02
54	7-FS-1069	0955	0940	1.48E+02	3.10E+02	2.68E+02
55	7-DF-1051	1015	1000	4.98E+02	6.54E+02	5.35E+02
56	7-WD-1081	1035	1020	DET	1.66E+02	1.39E+02
57	8-LS-1149	9/1 0735	9/2 0830	<MDL	DET	DET
58	8-CT-1082	0815	0910	6.20E+02	1.25E+03	1.02E+03
59	8-LV-1085	0915	0930	4.75E+02	1.69E+03	1.40E+03
60	8-FS-1075	0940	1000	<MDL	5.64E+02	5.15E+02
61	8-DF-1146	1000	1015	3.60E+02	1.58E+03	1.28E+03
62	8-WD-1150	1020	1030	8.74E+02	3.11E+02	2.83E+02
63	8-TB-1057	8/26 1400	9/6 0830	DET	<MDL	<MDL
64	N/A					

#45 – Lab-designated trip spike mistakenly used as field spike. See Table 8 of Lab Results.

#50 - Sample collection period outside of 24 +/-1 hour (1,380 to 1,500 minutes): 1,375 min

#63 – Trip blank

#64 – Due to field error, there is no sample #64

4.0 **Results** (continued)

Table 1

Monitoring Results (continued)

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
65	9-LS-1125	9/6 0800	9/7 0800	1.53E+02	1.14E+02	9.40E+01
66	9-LS-FS-1101	0805	0750	4.75E+03	2.06E+03	1.80E+03
67	9-CT-1103	0840	0840	1.43E+03	5.62E+03	4.83E+03
68	9-LV-1141	0910	0915	2.11E+03	1.10E+04	8.95E+03
69	9-FS-1053	0930	0940	1.40E+03	6.15E+03	6.29E+03
70	9-DF-1145	1000	1000	8.02E+02	1.34E+03	1.36E+03
71	9-WD-1076	1010	1020	1.88E+03	4.40E+02	3.02E+02
72	10-LS-1167	9/7 0805	9/8 0755	2.55E+02	DET	DET
73	10-LS-C-1139	0755	0805	2.13E+02	DET	DET
74	10-CT-1112	0845	0830	3.12E+02	3.77E+03	2.87E+03
75	10-CTC-1094	0850	0835	5.49E+02	3.82E+03	2.90E+03
76	10-LV-1123	0920	0900	3.04E+03	7.94E+03	6.75E+03
77	10-FS-1099	0945	0925	5.83E+02	1.19E+03	9.95E+02
78	10-DFC-1113	1005	0940	2.21E+02	4.90E+02	4.26E+02
79	10-DF-1087	1005	0950	1.50E+02	6.14E+02	5.38E+02
80	10-WD-1182	1025	1005	DET	1.82E+02	1.51E+02
81	10-WDC-1063	1030	1010	1.16E+02	1.69E+02	1.80E+02
82	11-LS-1165	9/8 0800	9/9 0805	DET	3.70E+02	3.15E+02
83	11-CT-1173	0835	0830	INVALID	2.55E+03	2.41E+03
84	11-LV-1162	0900	0850	3.77E+02	3.06E+03	2.88E+03
85	11-FS-1168	0930	0910	8.16E+02	7.41E+02	7.25E+02
86	11-DF-1086	0950	0920	INVALID	INVALID	INVALID
87	11-WD-1061	1010	0930	DET	5.48E+02	5.12E+02
88	11-TB-1074	9/1 0830	9/12 1300	SEE	TRIP BLANK	RESULTS
89	12-LS-1092	9/12 0830	9/13 0817	DET	2.40E+02	2.00E+02
90	12-LS-FS-1178	9/12 0832	9/12 0816	SEE	FIELD SPIKE	RESULTS
91	12-LS-TS-1175	9/8 1600	9/19 0800	SEE	TRIP SPIKE	RESULTS
92	12-CT-1186	9/12 0916	9/13 0905	INVALID	4.07E+04	3.61E+04
93	12-LV-1172	0950	0936	DET	1.10E+04	8.81E+03
94	12-FS-1084	1024	1007	DET	6.83E+03	6.16E+03
95	12-DF-1126	1052	1036	DET	1.68E+03	1.47E+02
96	12-WD-1132	1112	1108	DET	1.12E+03	8.66E+02

#83 and #92 – Invalid MeBr analytical results per lab

#86 – Invalid: <0.0 psig ending analytical canister vacuum.

#88 – Trip blank mistakenly identified as field blank in canister field log sheet.

#90 – Field spike; see Table 8 of Lab Results.

#91 – Trip spike; see Table 8 of Lab Results.

4.0 **Results** (continued)

Table 1

Monitoring Results (continued)

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
97	13-LS-1071	9/13 0824	9/14 0758	DET	1.33E+03	1.21E+03
98	13-CT-1158	0909	0848	INVALID	3.06E+04	3.16E+04
99	13-LV-1052	0939	0920	3.84E+02	3.24E+03	2.65E+03
100	13-FS-1111	1011	0954	DET	3.42E+03	2.76E+03
101	13-DF-1059	1044	1024	DET	7.18E+02	4.73E+02
102	12-WD-1054	1114	1053	DET	1.59E+03	9.84E+02
103	14-LS-1073	9/14 0801	9/15 0756	<MDL	3.04E+02	2.72E+02
104	14-LSC-1161	0804	0759	<MDL	2.75E+02	2.19E+02
105	14-CT-1180	0851	0841	DET	1.00E+04	1.08E+04
106	14-CTC-1062	0854	0847	DET	1.25E+04	1.32E+04
107	14-LV-1056	0923	0925	DET	7.53E+03	7.60E+03
108	14-LV-XXXX					
109	14-FS-1187	9/14 0957	9/15 0957	DET	1.42E+03	1.10E+03
110	14-FSC-1185	1000	1003	DET	2.21E+03	2.18E+03
111	14-DF-1097	1028	1025	DET	1.20E+03	1.08E+03
112	14-DF-C-1179	1032	1030	1.16E+02	6.25E+02	4.70E+02
113	14-WD-1105	1055	1049	DET	2.34E+03	2.07E+03
114	14-WDC-1137	1100	1055	1.47E+02	1.77E+03	1.31E+03
115	15-LS-1058	9/15 0801	9/16 0737	DET	1.70E+02	1.38E+02
116	15-CT-1098	0844	0812	1.30E+02	3.98E+03	3.17E+03
117	15-LV-1070	0929	0837	DET	6.39E+02	5.86E+02
118	15-LVC-1091	0933	0841	DET	7.40E+02	7.26E+02
119	15-FS-1133	1001	0904	INVALID	1.84E+03	1.70E+03
120	15-DF-1153	1027	0931	1.15E+02	6.68E+02	5.94E+02
121	15-WD-1176	1051	1052	3.64E+02	1.36E+03	1.30E+03
122	15-TB-1148	9/8 1600	9/19 0800	SEE	TRIP BLANK	RESULTS
123	16-LS-1102	9/19 1030	9/20 1000	DET	DET	DET
124	16-LSC-1136	1035	1005	<MDL	DET	DET
125	16-DF-1064	1110	1050	DET	1.54E+03	1.47E+03
126	16-WD-1090	1130	1130	<MDL	4.98E+02	5.45E+02
127	16-WDC-1152	1140	1135	DET	5.67E+02	5.85E+02
128	16-FS-1089	1215	1205	<MDL	9.73E+02	7.75E+02
129	16-FSC-1128	1220	1210	DET	1.26E+03	1.02E+03
130	16-LV-1140	1245	1250	<MDL	5.54E+02	5.69E+02
131	16-LVC-1108	1250	1255	<MDL	4.10E+02	3.87E+02
132	16-CT-1166	1335	1335	<MDL	5.39E+03	5.39E+03

#98 and #119-Invalid MeBr analytical results per lab

#108- Log # assigned but no sample collected due to malfunctioning flow regulator.

4.0 **Results** (continued)

Table 1

Monitoring Results (continued)

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
133	17-LS-1177	9/20 1010	9/21 0935	INVALID	INVALID	INVALID
134	17-DF-1150	1055	1030	DET	3.98E+02	3.73E+02
135	17-DF-C-1181	1100	1035	3.67E+02	5.99E+02	6.41E+02
136	17-WD-1106	1140	1100	DET	7.97E+02	9.18E+02
137	17-FS-1164	1215	1120	DET	9.68E+02	1.00E+03
138	17-LV-1075	1300	1200	DET	5.75E+02	5.38E+02
139	17-CT-1067	1340	1300	DET	1.87E+03	1.80E+03
140	17-CTC-1066	1345	1305	DET	2.16E+03	2.31E+03
141	18-LS-1147	9/21 0940	9/22 0945	DET	DET	DET
142	18-DF-1072	1040	1100	2.51E+02	3.69E+02	3.41E+02
143	18-WD-1105	1100	1125	1.24E+02	3.47E+02	2.50E+02
144	18-FS-1196	1120	1145	2.22E+02	7.41E+02	6.02E+02
145	18-LV-1050	1200	1210	DET	7.87E+02	8.91E+02
146	18-CT-1142	1310	1245	5.04E+02	1.86E+03	1.97E+03
147	19-LS-1138	9/22 0950	9/23 1020	DET	DET	DET
148	19-DF-1170	1105	1050	DET	1.58E+02	1.77E+02
149	19-WD-1122	1125	1110	1.79E+02	DET	1.03E+02
150	19-FS-1060	1150	1130	DET	DET	DET
151	19-LV-1104	1215	1150	4.16E+02	1.12E+02	1.62E+02
152	19-CT-1129	1245	1220	3.07E+02	1.27E+03	1.66E+03
153	20-LS-1110	9/26 0745	9/27 0730	DET	DET	DET
N/A	20-LS-FS-1149	0755	0735	SEE	FIELD SPIKE	RESULTS

#133 – Invalid: Slight ambient air leak into canister upon removal of flow controller.

#N/A – No log number is assigned to this Field Spike; otherwise OK.

4.0 **Results** (continued)

Table 1

Monitoring Results (continued)

Lab/Field Log Number	Sample Identification Name	Sample Start Date / Time	Sample Stop Date / Time	Lab Results (ng/m^3)		
				Methyl Bromide	cis-1,3-dichloropropene	trans-1,3-dichloropropene
154	20-CT-1086	0830	0820	1.39E+02	2.30E+02	2.58E+02
155	20-LV-1167	0855	0850	2.20E+02	DET	8.94E+01
156	20-FS-1145	0915	0920	1.32E+02	1.60E+02	2.46E+02
157	20-DF-1099	0930	0950	1.24E+02	DET	1.03E+02
158	20-WD-1065	0945	1030	DET	9.64E+01	1.41E+02
159	21-LS-1093	9/27 0740	9/28 0740	DET	DET	DET
160	21-LSC-1141	0745	0745	DET	DET	<MDL
161	21-CT-1076	0820	0820	DET	6.42E+02	8.90E+02
162	21-CT-C-1087	0825	0825	DET	6.72E+02	8.45E+02
163	21-LV-1053	0855	0850	2.37E+02	1.97E+02	2.59E+02
164	21-LVC-1088	0900	0855	1.56E+02	1.61E+02	2.12E+02
165	21-FS-1112	0930	0910	1.16E+02	5.37E+01	5.65E+01
166	21-FSC-1085	0935	0915	2.08E+02	5.37E+01	6.54E+01
167	21-DF-1080	0955	0940	INVALID	INVALID	INVALID
168	21-WD-1173	1005	1005	1.61E+02	7.79E+01	8.28E+01
169	22-LS-1107	9/28 0750	9/29 0750	DET	1.02E+02	<MDL
170	22-CT-1168	0820	0820	DET	4.06E+02	4.06E
171	22-LV-1101	0850	0840	DET	1.03E+02	1.27E+02
172	22-FS-1139	0920	0900	DET	DET	9.99E+01
173	22-DF-1103	0940	0920	1.59E+02	DET	7.56E+01
174	22-DFC-1082	0950	0925	DET	DET	9.02E+01
175	22-WD-1068	1010	0940	DET	DET	1.18E+02
176	22-WDC-1094	1015	0940	DET	7.53E+01	8.98E+01
177	23-LS-1171	9/29 0755	9/30 0700	<MDL	9.61E+01	DET
178	23-CT-1144	0825	0730	<MDL	1.98E+02	2.25E+02
179	23-LV-1163	0845	0750	DET	1.47E+02	1.99E+02
180	23-FS-1169	0905	0810	2.47E+02	DET	7.30E+01
181	23-DF-1134	0920	0820	5.32E+02	DET	9.92E+01
182	23-WD-1113	0945	0835	1.57E+02	DET	7.53E+01
183	23-WD-TS-1146	9/25 0900	10/3 1045	SEE	TRIP SPIKE	RESULTS

#167 – Canister opened but no sample collected due to controller malfunction.

#182 - Sample collection period outside of 24 +/-1 hour (1,380 to 1,500 minutes): 1,370 min

#183 – Trip Spike; see Table 8, Field Spike of Lab Report

5.0 Quality Control Results

- Quality Control samples (excluding laboratory spikes) collected from the field consisted of 34 collocated canister pairs, 4 Field Spikes, 2 Trip Spikes, and 4 Trip Blanks. The following bullets summarize these Quality Control results. For more detailed information, see **Table 2,** "Collocated QC Results" and **Appendix C** of the Laboratory Results Report.

- Collocated sample results and **R**elative **P**ercent **D**ifferences, a-b ÷ [(a+b) ÷2] x 100 = **RPD**, for valid primary and collocated sample pairs are presented in **Table 2** of this report.

- For methyl bromide, of 16 valid collocated pairs, the **RPD** ranged from 5.0 to 56.8% with an average of 28.7%.

- For cis-1,3-dichloropropene, of 26 valid collocated pairs, the **RPD** ranged from 0.0 to 63.0% with an average of 17.9%.

- For trans-1,3-dichloropropene, of 29 valid collocated pairs, the **RPD** ranged from 1.1 to 78.7% with an average of 24.1%.

- Field spike recovery rates for methyl bromide, cis-1,3-dichloropropene and trans-1,3-dichloropropene averaged 93%, 75% and 68% respectively.

- All trip-blank results were less than the estimated quantitation limit (**EQL**).

- Four (4) canister samples (#'s 1, 64,108, and 133) were invalidated by SPMS due to field problems.

- Four (4) canister samples (#'s 29, 30, 50, and 182) were flagged by SPMS due to sample collection periods outside of 24 +/-1 hour limits.

- One (1) canister sample (#86) was invalidated by SPMS due to analytical canister pressure less than 0.0 psig.

- Eight (8) methyl bromide results (#'s 2, 3, 9, 10, 83, 92, 98, and 119) were invalidated by the laboratory due to analytical problems.

5.0 Quality Control Results (continued)

Table 2

Collocated QC Results
(arranged by site)

Lab/Field Log Number	Sample Identification	Sampler ID No.	Correct Avg Flow	MeBr RPD	C-Telone RPD	T-Telone RPD	Lab Results (ng/m^3)		
							Methyl Bromide	Cis-Telone	Trans-Telone
7	2-LS-1097	1	3.0	11.7	1.0	4.1	1.37E+02	1.97E+02	1.91E+02
8	2-LS-C-1084	6	3.0				1.54E+02	1.99E+02	1.99E+02
32	5-LS-1151	1	3.1	35.9	---	2.2	6.94E+02	DET	1.39E+02
33	5-LS-C-1068	6	3.1				4.83E+02	1.56E+02	1.36E+02
72	10-LS-1167	1	3.1	17.9	---	---	2.55E+02	DET	DET
73	10-LS-C-1139	6	2.9				2.13E+02	DET	DET
103	14-LS-1073	1	2.8	---	10.0	21.6	<MDL	3.09E+02	2.72E+02
104	14-LSC-1161	6	3.0				<MDL	2.75E+02	2.19E+02
123	16-LS-1102	1	3.2	---	---	---	DET	DET	DET
124	16-LSC-1136	6	3.0				<MDL	DET	DET
159	21-LS-1093	1	2.9	---	---	---	DET	DET	DET
160	21-LSC-1141	6	2.9				DET	DET	<MDL
Lincoln School Average RPD:				**21.8**	**5.5**	**9.3**			
9	2-CT-1137	5	3.0	---	11.3	6.5	INVALID	2.90E+03	2.37E+03
10	2-CT-C-1111	4	3.1				INVALID	2.59E+03	2.22E+03
34	5-CT-1142	4	3.1	35.6	14.2	16.6	6.29E+02	2.49E+02	2.42E+02
35	5-CT-C-1177	5	2.8				9.01E+02	2.16E+02	2.05E+02
74	10-CT-1112	4	2.9	55.1	1.3	1.1	3.12E+02	3.77E+03	2.87E+03
75	10-CTC-1094	5	2.8				5.49E+02	3.82E+03	2.90E+03
105	14-CT-1180	4	3.1	---	22.2	20.0	DET	1.00E+04	1.08E+04
106	14-CTC-1062	5	2.9				DET	1.25E+04	1.32E+04
139	17-CT-1067	4	3.0	---	14.4	24.8	DET	1.87E+03	1.80E+03
140	17-CTC-1066	15	2.6				DET	2.16E+03	2.31E+03
161	21-CT-1076	4	3.0	---	4.6	5.2	DET	6.42E+02	8.90E+02
162	21-CT-C-1087	15	2.9				DET	6.72E+02	8.45E+02
CalTrans Average RPD:				**45.4**	**11.3**	**12.4**			
11	2-LV-1176	14	2.5	39.8	47.1	63.6	2.71E+03	1.07E+03	1.16E+03
12	2-LV-C-1157	12	1.7				1.81E+03	6.62E+02	6.00E+02
36	5-LV-1196	14	2.8	44.9	---	---	2.10E+03	3.71E+02	3.28E+02
37	5-LV-C-1067	12	1.7				1.33E+03	DET	DET
107	14-LV-1056	10	3.2	---	---	---	DET	7.53E+03	7.60E+03
108	14-LV-XXXX	14	0				INVALID	INVALID	INVALID
130	16-LV-1140	10	3.1	---	29.9	38.1	<MDL	5.54E+02	5.69E+02
131	16-LVC-1108	5	2.8				<MDL	4.10E+02	3.87E+02
163	21-LV-1053	10	3.1	41.2	20.1	20.0	2.37E+02	1.97E+02	2.59E+02
164	21-LVC-1088	5	2.8				1.56E+02	1.61E+02	2.12E+02
Laguna Vista School Average RPD:				**42.0**	**32.4**	**40.6**			

5.0 Quality Control Results (continued)

Table 2

Collocated QC Results (continued)
(arranged by site)

Lab/Field Log Number	Sample Identification	Sampler ID No.	Correct Avg Flow	MeBr RPD	C-Telone RPD	T-Telone RPD	Lab Results (ng/m^3)		
							Methyl Bromide	Cis-Telone	Trans-Telone
13	2-FS-1133	11	2.8	9.4	0.3	12.4	7.59E+02	7.01E+02	7.36E+02
14	2-FS-C-1178	10	3.0				6.91E+02	7.03E+02	6.50E+02
38	5-FS-1050	11	3.0	16.6	22.9	31.1	4.25E+03	4.98E+02	4.67E+02
39	5-FS-C-1066	10	3.1				3.60E+03	6.27E+02	6.39E+02
109	14-FS-1187	11	2.9	---	43.5	65.9	DET	1.42E+03	1.10E+03
110	14-FSC-1185	3	2.8				DET	2.21E+03	2.18E+03
128	16-FS-1089	11	2.8	---	25.7	27.3	<MDL	9.73E+02	7.75E+02
129	16-FSC-1128	3	2.8				DET	1.26E+03	1.02E+03
165	21-FS-1112	3	2.8	56.8	00.0	14.6	1.16E+02	5.37E+01	5.65E+01
166	21-FSC-1085	11	2.8				2.08E+02	5.37E+01	6.54E+01
Fire Station Average RPD:				**27.6**	**18.5**	**30.3**			
15	2-DF-1179	13	3.0	5.0	1.9	2.1	7.65E+02	4.76E+02	4.92E+02
16	2-DF-C-1159	6	3.0				8.04E+02	4.85E+02	4.82E+02
40	5-DF-1164	9	3.1	8.6	9.3	15.5	1.45E+04	5.67E+02	4.70E+02
41	5-DF-C-1129	13	2.9				1.58E+04	6.22E+02	5.49E+02
78	10-DFC-1113	9	3.1	38.3	22.5	23.2	2.21E+02	4.90E+02	4.26E+02
79	10-DF-1087	13	3.0				1.50E+02	6.14E+02	5.38E+02
111	14-DF-1097	9	3.1	---	63.0	78.7	DET	1.20E+03	1.08E+03
112	14-DF-C-1179	13	3.0				1.16E+02	6.25E+02	4.70E+02
134	17-DF-1150	13	3.0	---	40.3	52.9	DET	3.98E+02	3.73E+02
135	17-DF-C-1181	9	3.0				3.67E+02	5.99E+02	6.41E+02
173	22-DF-1103	15	2.7	---	---	17.6	1.59E+02	DET	7.56E+01
174	22-DFC-1082	9	3.1				DET	DET	9.02E+01
CA Dept. of Forestry Average RPD:				**17.3**	**27.4**	**31.7**			
17	2-WD-1071	15	2.8	11.3	9.9	8.7	6.94E+02	1.38E+03	1.32E+03
18	2-WD-C-1180	8	2.8				6.20E+02	1.25E+03	1.21E+03
42	5-WD-1128	8	2.9	24.2	3.7	15.9	1.20E+04	1.38E+03	1.16E+03
43	5-WD-C-1090	15	2.8				1.53E+04	1.33E+03	1.36E+03
80	10-WD-1182	8	3.0	---	7.4	17.5	DET	1.82E+02	1.51E+02
81	10-WDC-1063	15	2.8				1.16E+02	1.69E+02	1.80E+02
113	14-WD-1105	8	3.0	---	27.7	45.0	DET	2.34E+03	2.07E+03
114	14-WDC-1137	15	2.8				1.47E+02	1.77E+03	1.31E+03
126	16-WD-1090	8	3.0	---	13.0	7.1	<MDL	4.98E+02	5.45E+02
127	16-WDC-1152	15	2.6				DET	5.67E+02	5.85E+02
175	22-WD-1068	8	2.8	---	---	27.1	DET	DET	1.18E+02
176	22-WDC-1094	3	2.9				DET	7.53E+01	8.98E+01
Water District Average RPD:				**17.8**	**12.3**	**20.2**			